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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/929,456	08/13/2001	Alain M.J. Beguin	SP01-112	8554

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EXAMINER

TRAN, BINH X

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 07/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/929,456

Applicant(s)

BEGUIN ET AL.

Examiner

Binh X Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 11-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 11-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 11 is rejected under 35 U.S.C. 102(e) as being anticipated by Deacon (US 6,293,688).

Deacon discloses a method of fabricating a waveguide comprising the step of etching a waveguide couples (read on "transition region") with a reactive ion etch to form vertical tapered regions between within an area between the closely spaced waveguide (Fig 1, 7, 5 and col. 21-22).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-3, 5-6, 12-13, 15-16, 18, 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deacon (US 6,293,688) in view of Kashihara et al. (US 6,563,986).

Respect to claim 1, Deacon discloses the optical device includes the arrayed waveguides (Fig 5). However, Deacon fails to explicitly disclose optical device is an arrayed wavelength division multiplexer. Kashihara disclose array wavelength division multiplexer having a closed spaced arrayed waveguides (4) and a slab waveguide (3 and/or 5). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Deacon in view of Kashihara by having an array wavelength division multiplexer because it will further improve the quality of optical wavelength communication.

Respect to claim 2-3, Deacon discloses the reactive ion etching gas is polymerizing gas CHF_3 (col. 22 lines 7-15). Respect to claim 5, Deacon discloses the waveguide couples includes doped silica core (col. 7 lines 25-35). Respect to claim 6, Kashihara discloses the spacing between individual waveguides (4a) in the arrayed waveguide (4) is smaller at the junction between the arrayed waveguide and the slab

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waveguide (3 or 5) than away from the junction (See 1a-1b). Respect to claim 12, Deacon discloses the doped silica core (col. 7 lines 25-35 or lines 55-56).

Respect to claims 13 and 18, Deacon teaches to apply a photoresist to cover a core layer in the transition region and etching the transition region with reactive ion etching to form vertical tapered region (col. 21 line 44 to col. 22 line 16; Note: "core layer" read on "optical layer" limitation). Deacon fails to disclose the slab region and a distance separating each of the waveguides reduces along a transition region proximate to the slab region or transition region. Kashihara discloses a slab region (3 and/or 5) and a distance separating each of the waveguides (4) reduces along the transition region proximate to the slab region (Fig 1b). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Deacon in view of Kashihara by having a slab region and a distance separating each of the waveguides (4) reduces along a transition region proximate to the slab region because it will further improve the quality of optical wavelength communication. The limitation of claims 15-16, 20-21 was discussed above.

6. Claims 4, 17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deacon and Kashihara as applied to claims 2, 15 and 20 above, and further in view of Merry et al. (US 6,015,761).

Respect to claims 4, 17 and 22, Deacon fails to disclose the etching gas is a gas mixture comprises multiple components as disclose by applicants. However, Deacon discloses the etching gas include CHF_3 (col. 22 lines 5-15). In a semiconductor etching method, Merry teaches to use a gas selected from the group consisting of CHF_3 , CF_4 ,

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C₂F₆, C₃F₈, C₄F₈ and the mixtures thereof (col. 16 lines 28-32). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Deacon and Kashihara in view of Merry by using the multiple gas components selected from the group consisting of CHF₃, CF₄, C₂F₆, C₃F₈, C₄F₈ because equivalent and substitution of one for the other would produce an expected result.

7. Claims 14, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deacon and Kashihara as applied to claims 2, 15 above, and further in view of Hosoi (US 2002/0001433 A1).

Claims 14 and 19 differ from Deacon and Kashihara by further disclosing that the height of the tapered region proximate is substantially the same height of each waveguides. Hosoi discloses the maximum height of the tapered region is substantially the same height of each waveguides (top portion of Figure 7). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Deacon and Kashihara in view of Hosoi by having maximum height of the tapered region is substantially the same height of each waveguides because this will create an array waveguide grating having flat optical frequency characteristics.

Response to Arguments

8. Applicant's arguments filed 4-23-2004 have been fully considered but they are not persuasive.

The applicants argue, "the tapered waveguides segments disclosed in Deacon are not within an area between closely spaced waveguides". According to applicants, the waveguide segments (122, 124) and the tapered waveguide segments (126, 128)

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are disposed adjacent to the laser waveguide (112, 114). Therefore, "any possible area between the waveguide segments (126, 122, 128, 124) and the laser waveguides (112, 114) at the butt coupling is filled with air, vacuum, or a material with a selected index of refraction". The examiner disagrees with this argument. The examiner recognizes that laser waveguides (112, 114) is butt coupled into the waveguide (122, 124). However, Deacon clearly discloses the tapered segments (126, 128) are within an area between the closely spaced waveguides (112, 114, 122, 124) (See Fig 5). There is no limitation in the claims which excluding butt coupling.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X Tran whose telephone number is (571) 272-

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1469. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Binh X. Tran

NADINE G. NORTON
SUPERVISORY PATENT EXAMINER
Nadine Norton